

IN THE DRAWINGS:

Formal drawings have been previously presented.

REMARKS (5/16/06)

In response to the Examiner's Office Action of March 15, 2006, Applicants would provide the following comments and considerations.

Minor clarifications have now been made to the specification and further, the objection to claim 3 has now been handled in view of the newly-amended claims.

The Examiner has rejected the claims 1 and 5-10 under 35 USC 102(b) as being anticipated by the publication to Microsoft --- *Microsoft Corporation, Server Clusters: Majority Node Sets (aka Quorum of Nodes)*, published in June 2002.

Applicants would traverse Examiner's considerations of anticipation in view of the newly-amended claims.

For purposes of clarification in regard to the Microsoft cited reference, Applicants would like to differentiate this reference as being in two separate parts.

A. Within this document there is a page entitled "Background" listed as page 1 which continues until page 8. This section of the document therefore has pages 1-8.

B. Here, there is the Microsoft paper entitled "*Server Clusters: Majority Node Sets (aka Quorum of Nodes)*". This document is indicated as having pages 1 through 9.

Then subsequently, Examiner has rejected claims 2, 3 and 4 for obviousness under 35 USC 103(a) as unpatentable over Microsoft in view of Kumar, U.S. Patent 6,789,213.

Here, the Examiner has indicated that Microsoft does not disclose the means to convert a multiplicity of cluster nodes into a single node, nor means to troubleshoot a single node to define the cause of its operability. Then, Examiner contends that the Kumar reference could then be utilized to fulfill these functions, thus combining Microsoft with Kumar to contend that this develops the equivalent of Applicants' claims. Here, Examiner cites the Kumar reference, at column 8, lines 16-47, where a cluster of nodes is reduced to a single "first node" which is then used to test connectivity to see if a disjointed sub-cluster has formed.

Examiner then contends that this would be obvious because Microsoft discloses a "need to determine" which nodes remain connected and which are in non-majority partitions citing Microsoft page 3, section from "In The Case Of".

Further, the Examiner cites Kumar column 8, lines 19-31, where the detection of activation signals will sense a network outage in Applicants' clause (dx1).

Then, Examiner contends that Applicants' clause (dx2) -- means to enable the remaining group holding the majority of nodes to continue in optimal activity -- as being taught by Microsoft page 3, with the paragraph starting "In A Traditional MSCS Cluster" --.

The problem solved by Applicants' invention involves how to deal with the majority nodes set cluster, when nodes become non-operational or become operational. This is very similar to the problems involved in the Microsoft reference.

Applicants' invention provides a means to "automate" the steps seen in the Microsoft paper, by eliminating all of the manual intervention required by Microsoft, except for the case in selecting a controlling node for the cluster. It will be seen that much of the operations dealing with individual nodes in the Microsoft citation instructions --- also involves doing the steps in potentially different locations.

Some steps in Microsoft involve manually editing the Windows Registry --- this is potentially error-prone and subsequently dangerous action in trying to reconstitute the system.

In regard to the reference to the Kumar patent, here we see the only interaction between nodes in a cluster which is therein considered appears to be the "heartbeat" used on the communication network. While this is the most likely problem causing a majority node set to have what is called a "split-brain" condition, a node could also experience other problems in either the storage communications or in the remote process communications which are elements that are detected by Applicants' configuration in his invention. Thus, it can be seen that Applicants' invention involves a much more expansive and efficient handling of the situation after node failure.

And reiterating the other important factor is that Applicants provide a "means to automate" and eliminate all the manual intervention that is required in the case of Microsoft.

Now, it would be useful to look at some of the detailed types of teaching in the Microsoft reference and in the first White Paper section A, designated "*Windows Server 2003: Server Clusters: Quorum Options:*"

Here, if we look at page 7 of this document, there will be seen a question set by Microsoft as follows --- is there a way I can allow for a "minority" set to take control of the cluster?

Answer by Microsoft: Yes, there is way for a "minority" set to be allowed to start-up and initialize the

cluster, but this is a manual process and has to be done in a specified manner. Details on the same are available in "Help".

Thus, we see the necessity for manual manipulation in a complex situation.

Now referring to the second White Paper section B, entitled "Server Clusters: Majority Node Sets (aka Quorum Nodes):"

Here, referring to page 6 of the nine pages, at the middle of the page at the third paragraph it should be noted that Microsoft states --- forcing quorum is a manual process that requires the following steps. It then goes to list some six separate steps which must be effectuated in order to force the quorum.

Now, further in regard to the White Paper section B of Microsoft, at page 7, there will be seen series of manual steps and operations which Microsoft requires starting at the fifth line which says --- special care must be taken if and when the primary site comes back ---.

Here, it should be noted that again a complex manual action and operation is necessary on the part of Microsoft -- and quite contrarily, this is all done automatically in Applicants' system.

In regard to claims 1, 2, 3 and 4, certain aspects of these clauses may be useful to be clarified.

Clause (a) and clause (b) are functions within the MSCS and are derived from Microsoft operational capability. Now, clause (c) refers to the mechanism that MSCS uses to allow one or more nodes to drop out of a cluster. However, in Applicants'

configuration, the means to utilize the nodes in clause (c) involves an automatic method to synchronize the remaining nodes and to change the underlying cluster mechanism when the nodes count falls below the number designated $M/2+1$. This indicates that the node count is greater than 50% of the total number of nodes.

Clause (d) of the prior claim 2, refers to a majority node set cluster having a "split brain" with each side having less than the $M/2+1$ number of nodes, thus effectively shutting-down both sides of the cluster.

This means of clause (d) invites manual intervention to select which side of the split cluster will continue as the externally visible cluster (until the entire cluster can be reconstituted).

Clause (e) indicates that the configuration provides a means to troubleshoot not only the activation signal test (heartbeat cited in the Kumar reference), but to troubleshoot also the storage functionality and the remote process capability, each of which can be done both from the functional cluster, as well as from the non-functional nodes.

Clause (dx1) indicates the means to detect a network outage of both network traffic (as does Kumar), but also to detect storage traffic via the mechanism used to make visible storage to each member node of the cluster.

Regarding clause (dx2), this shows the means that the means allows for the cluster to operate even with less than the majority of the nodes (if allowed by manual intervention).

Clause (dx3) includes a means to take off-line the non-functional nodes by automation of the manual steps which were required by Microsoft of their White Paper.

Regarding Applicants' claim 5(a), this invention does not interfere with the operation of the majority node set cluster while it is operating with more than half of the nodes (more than 50%).

For Applicants' clause (b) of claim 5, it is seen that -- the means uses the standard mechanism for the majority node set cluster if the count of the nodes is $M/2+1$ --- but note it uses a different mechanism if the node count falls below that number. In the latter case here, manual intervention may be required to indicate which of the functioning nodes will assume control of the cluster.

Regarding Applicants' claim 6(b1), this is required as only a majority node set cluster must endure the extra steps required by Applicants' configuration.

Regarding Applicants' claim 7(b1a) -- this provides a means to automate the process which was used by Microsoft to revive and to put back online a non-functioning server node. Thus, the complex manual intervention required by Microsoft is no longer needed.

In Applicants' claim 7(b1b) -- here, this means monitors when a node is to be revived, and then whether sufficient nodes are eligible to reconstitute the cluster to form a majority node set cluster.

Regarding Applicants' claim 8(b1ba) -- this is to provide a means to determine the original number of nodes which then calculates when sufficient nodes would allow the shift from a forced quorum over to a majority node set cluster.

Regarding Applicants' claim 9(a) -- this provides a means to determine the mechanism which is to be employed for the next node which will be coming functional. Thus, either both the Revival and the Reconstitute phases in the cluster is presently a forced quorum cluster --- the Revival Phase is only for a functioning majority node set cluster, or

neither if the cluster is running as a traditional cluster service.

In Applicants' claim 9(b) -- this will create a forced quorum condition and the means involved will automate the update of settings for the remaining functional nodes in the cluster, requiring only manual intervention to select the node to act as a control for the cluster.

In Applicants' claim 9(c) -- this will create a functional majority node set cluster when sufficient nodes are functional and then through automation will revert any settings used to create the forced quorum condition on each individual node.

In regard to Applicants' claim 10 -- here, clause (c1) will provide the means to revert to simply monitoring the fully-functional majority node set cluster, instead of supplying the means to convert each from a forced quorum to a majority node set cluster.

In Applicants' claim 10(c2) -- any additional nodes will be added by automation into the majority node set cluster.

Thus, basically, Applicants have provided a system and configuration to automate a number of steps which would normally be required by Microsoft to be handled in a manual fashion.

Thus, Applicants eliminate all of the manual intervention, except for that of selecting a controlling node for the cluster.

Applicants' system does not require to do manual steps in different locations, nor does it involve manually editing the Windows Registry.

Again, as previously mentioned, the Kumar patent only considers the interaction between nodes in a cluster through use of a heartbeat on the communication network. However, it should be noted that any node could experience other problems, problems in communication storage, or problems in remote process communications which are detectable in Applicants' system, but not provided for in the Microsoft or the Kumar arrangement.

Thus, now, it should be considered that under the present law of patents, it is impermissible for the Examiner to pull-out a technology from a secondary reference and apply it to a primary reference on the basis that combination would provide for the teaching of Applicants' system. Additionally, there must be some "motivation" for this to happen.

For example, the case of In re Jones, 21 USPQ2d, 1941 (Fed.Cir.1992), where the Court held the following:

Before the PTO may combine the disclosures of two or more prior art references in order to establish *prima facie* obviousness, there must be some suggestion for doing so. . . . In re Fine, 5 USPQ2d, 1596, 1598-99 (Fed.Cir.1988).

The prior art must provide one of ordinary skill in the art. The motivation to make the proposed molecular modifications needed to arrive at the claimed compound. [At page 1944].

As a further matter, it has been very recently set forth that the motivating suggestion must be explicit as was decided in the case of Winner International Realty Corporation v. Wang, No. 96-2107, 48 USPQ2d, 1139 (District Court D.C. 1998), where the Court held:

" . . . invention cannot be found obvious unless there was some explicit teaching or suggestion in the art to motivate one of ordinary skill to combine elements so as to create same invention." [at page 1140].

Another important factor which has been emphasized on the subject of "motivation" involves the case of In Re Kahn, Fed.Cir., No. 04-1616, 3/22/06. Here, the Court of Appeals for the Federal Circuit ruled that a decision by the Board of Patent Appeals and interferences, where their obviousness rejection was required that they must articulate the motivation, suggestion or teaching that would have led the skilled artisan at the time of the invention to combine prior art elements to make the claimed invention.

The Federal Court here then stated the following ---

When the Board does not explain the motivation, or the suggestion or teaching that would have led the skilled artisan at the time of the invention to the claimed invention as a whole, we infer that the Board



used hindsight to conclude that the invention
was obvious.

In view of the amendments to the claims and to the legal requirements regarding the combination of references and explicit need for motivation, it is now respectfully requested that Examiner review Applicants' claims as a whole in their entirety and understand that the various elements of Applicants' claims go much beyond any teaching of Microsoft and Kumar, and in this respect, it is requested that Examiner will now consider the virtue of Applicants' claims and provide a timely Notice of Allowance therefor.

Respectfully submitted,

By Alfred W. Kozak
Alfred W. Kozak
Reg. No. 24,265
(858) 451-4615
(949) 380-5822

Certificate of Mailing (37 CFR 1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: MAIL STOP AMENDMENT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date:

June 7, 2006

Patti S. Preddy

Patti S. Preddy